Budget Mechanism of Regional Innovation Policy in Russia: Supply Chain Planning, Scheduling and Control

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Abstract— Supply chain management (SCM) has been stressed as a remedy to many of the underlying issues in the construction industry. The article is devoted to an actual topic in Russia related to the development and improvement of the budget mechanism for regional innovation policy. The article's main scientific and practical problem is the inefficiency of the current innovation policy budget mechanism, based on centralized resource support of the territory innovative development and the weak role of the regions in the country innovation infrastructure formation. The main hypothesis of the research is that the budget mechanism improvement is a necessary and priority factor for resource provision efficiency increase concerning innovation activity in Russia, and also represents an integral part of territorial management optimization concerning innovation development in Russia. The purpose of the research is to actualize the current situation and the problems associated with the implementation of the regional innovation policy budget mechanism in Russia. Based on the researches about existing innovation development model in the country, the author identifies the most important problems in the budget mechanism functioning of regional innovation policy at the present stage: the low role of the regions in the resource provision for innovation activity and the weak, ineffective modern instruments of the regional budget mechanism. The article reflects the low degree of region involvement in the innovation financing process, considers the phenomenon of multidirectional management decisions due to the inconsistency of the various elements in the program-target planning for innovative development.

Keywords— *Budget mechanism, Russian innovation policy, regional innovation policy, budget mechanism improvement, supply chain control, research financing, innovation management, innovation activity stimulation, state innovation programs.*

1. Introduction

Supply chain planning (SCP) is the component of supply chain management (SCM) that develops a strategy for balancing supply and demand, predicting future requirements and monitoring fulfillment. Innovation activity is a special kind of human activity associated with the transformation of ideas (usually the research and developments results) into a new, modified or improved product. The novelty and unpredictability of innovation makes it high-risky from an economic aspect [1]. The American Scientist B. Twiss notes that commercial success is achieved only in 10% of the initiated projects, therefore, the failure rate can be estimated at 90% [2]. Therefore, initially, only powerful, self-confident business entities, such as large corporations and governments, can allow the financing of innovations. The less developed a country is, the stronger the role of the state in the resource provision for innovations.

State financing of innovation policy in different countries is carried out through the budget mechanism, which is a set of ways to organize budget relations that the state uses to ensure favorable conditions for innovative development [3, 4]. The practice of developed countries shows that an effective budget mechanism can provoke a multiplicative innovative effect at the national level.

At present, the emphasis on the implementation of the innovation potential in developed countries is shifting from the central authority to the regions, forming not a centralized, but a territorial-sectoral model of innovation management. The strengthening of the regional-sectoral component is dictated by the very essence of the innovation policy, which creates the foundations for the sustainable development of territories and industrial complexes through the effective use of their existing labor, scientific, technical and production potentials. Since the end of the twentieth century, there has been a gradual strengthening the role of regions in innovation development in developed countries, achieved both through partial decentralization of innovation management and through the internal innovation efficiency increase. Nowadays, regions and industry structures compete with each other for resources to create local innovation development bases (enterprises, research centers, projects, etc.) in the USA, Germany, Japan and other countries.

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Even in medium-sized countries with a unitary state structure (there are many such countries in the European Union), individual economic entities of the meso-level have the opportunity to pursue an independent innovation policy [5-8].

The purpose of this research is to update the current situation and the problems associated with the implementation of the budget mechanism for regional innovation policy in Russia. The article's main scientific and practical problem is the inefficiency of the current innovation policy budget mechanism, based on mainly centralized resource support of the territories innovative development and the weak role of the regions in the innovation infrastructure formation in the country. The author adheres to the position of an active development of motives and incentives for innovative development specifically on regional platforms due to the large role that regions play in population life quality provision and the territories economic growth.

2. Methods

The research's methodological basis is the general provisions of modern economics, in particular: the regional economy, the territories sustainable development theory, the efficiency theory, and the innovative development concept. However, the positive examples where SCM has been successfully utilized and diminished the lingering issues in construction is scarce. In terms of methodology, the research is based on general methods of economic and institutional analysis, including systematization, generalization, abstraction, comparisons, expert assessments, as well as the approaches used in global management decision-making practice.

The use of systematic approach takes into account the article's object specifics. The research is based on the classical conceptual apparatus developed by world science, which allows to explore such common scientific categories as innovation, innovation activity, innovation development, and innovation policy objectively and reasonably. Innovation is the result of research and development, presented as a new or improved product (technology). Innovation activity is the process; work aimed at transfer of research and development results into a new product or technology. Innovation policy is a part of macroeconomic policy that defines the goals, trends, forms of government agencies activity in the field of the science development, technology and the science and technology results implementation. Innovative development is the gradual and continuous implementation of innovation policy for commercialization of innovations, i.e. for turning innovation into a real market product and making some profit from its implementation.

3. Scientific background of the research

The scientific interest in the problem of the budget mechanism functioning and improvement for the regional innovation policy of Russia is quite natural, taking into account the large role of the state in the resource provision for the territories innovation activity. Experts consider this problem in the following main contexts:

- the solution of administrative and economic and legal problems in innovative development. According to some scientists, the root of many problems with the funds provision and distribution is the problems of too general methodological order [6, 7]. Also, the subject of active study in the world scientific literature is the Russian specificity of the historical course for national innovative economy development [8-10];
- optimization of the federal budget expenditure structure. According to researchers, the budget of modern Russia has a low innovative focus: in 2018, the share of spending on R&D (including the military ones) made only 1.1% of GDP. The current volume of innovation financing in the real sector of the economy will not allow soon a significant breakthrough in the domestic production modernization. Studies show that there is no clear relationship between production growth and the R&D financing in Russia [10-12];
- the territorial and sectoral management improvement by innovative development. Cluster and territorial approaches to the innovative processes management is an important trend of recent years, not only due to the scale and spatial structure of the country, but also to the need to implement the innovation potential systemically throughout the country, and not fragmentarily in individual local areas [13-15]. Since any innovative project has a specific regional linkage, and the regions actively compete for innovation capital, the improvement of fund allocation mechanism across territories and industries is one of the priority tasks for Russian experts [16-19].

Taking into account the goals and the objectives that Russia faces in accordance with the Strategy for Innovative Development until 2020, there is currently an urgent need to improve the budget mechanism for regional innovation policy. This improvement is necessary in order to overcome the trend of slowing down the budget financing for R&D, overcoming the dependence of regions on the state, strengthening the existing mechanism for innovation stimulation in the regions.

4. Research results

4.1 The problem of resource support for innovation in the regions

Today the role of regional funds in innovation activity financing is very small in Russia. The federal budget accounts for 96.2% of the total amount of public expenditures on research and development, and regional budgets account only for 3.8% of such costs. The degree of the regional independence during decision making is rather low, despite the legal possibilities for scientific and technical activity management at the appropriate level. In total, there are 178 research organizations owned by the constituent entities of the Russian Federation, which makes 4.4% of the total number of Russian organizations implementing R&D. The small cohort of such enterprises has a narrow resource potential and, thus, low innovative activity: the share of regional enterprises accounts only for 2.2% of fixed assets used in the innovation process, 1.6% of staff and 1.5% of financial resources (Table 1).

Table 1. Resource potential of Russian research organizations with various forms of ownership, 2017

Ownership forms	Number of companies, performing R&D		Main assets on R&D		R&D staff		Internal costs for R&D	
	Value	Share, %	Mln. rubles	Share, %	Thous. of men	Share, %	Billion rubles	Share, %
Total	*4 032*	*100,0*	*1 696,2*	*100,0*	*722,3*	*100,0*	*943,8*	*100,0*
Federal	2 414	59,9	1 188,7	70,1	447,4	61,9	536,4	52,6
RF subjects	178	4,4	36,7	2,2	11,6	1,6	16,9	1,7
Private	865	21,5	154,4	9,1	99,3	13,7	149,0	15,8
Mixed	326	8,1	194,7	11,5	121,1	16,8	168,1	17,8
Other	249	6,2	121,7	7,2	42,9	5,9	56,9	6,0

Source: [20, 21]

In order to expand the innovation potential of the regions and develop the public-private partnership in the innovation sphere, the Government Commission on High Technologies and Innovations of Russian Federation compiled the list of regional cluster development projects in 2012, the implementation of which provisioned the development of new mechanisms for state support. The regional innovation clusters list provided support through the subsidies provision from the federal budget and included 13 clusters from 12 constituent subjects of Russian Federation. The development of another 12 clusters was supposed to be supported at the first stage without subsidies provision from the federal budget. The selected clusters were considered as “growth points”, the development of which was supposed to give a multiplier effect for the entire innovation system of the country. The proposed financial and institutional mechanism tuned to a more even and harmonious innovative development of the country through an effective using local resource, mainly personnel, equipment and intellectual property.

The main criteria for obtaining subsidies from the federal budget were the presence of a developed innovation infrastructure and high scientific and technological potential. In accordance with these criteria, a significant part of the budget was distributed among research centers located in Moscow, Novosibirsk and Tomsk regions. At that, despite the positive dynamics in the re-equipment of capacities and the implementation of scientific research, the level of most clusters has been listed as “initial” since 2012, i.e. without significant commercialization of scientific results.[2] Besides, competitive financing in the innovation sphere of Russia leads so far not so much to the increase of competitiveness for competitive bids as to the deepening of differentiation in the territories socio-economic development, the grotesque forms of regional struggle for federal resources [20-32]. This limits the potential of both innovation and economic development of the regions as a whole.

2.2 The problem of budget mechanism instruments improvement

The main problem hindering the development of territorial growth points is the low efficiency of management methods for territorial scientific and technical complexes, also through program-oriented planning. At the current stage, it is not possible to integrate regional program effectively into the national system of program-targeted support for innovation because of the incommensurability of the components, its

elements, and the lack of clear coordination in the choice of methods for a regulatory framework, modes and regulation development to implement programs, methods for analysis, forecasting and region innovation potential evaluation. So, there are fragmentation and locality for the country innovative activity evaluation.

Let's consider the general scheme of budget funds planning and distribution allocated to support innovation through government programs.

All implemented government programs are designed to ensure coordinated territorial and sectoral planning and an optimal placement of innovative infrastructure units. However, under the current interbudget relations, various segments of the national innovation system turned out to be within the boundaries of multidirectional management decisions: the territorial innovation sector as a sectoral management subject should be included in financing through the system of targeted budget expenditures planning, and as an object of territorial formation (for example, a cluster) - to the software-industry system [24, 33]. In this regard, the question arises about the correctness of criterion choice for budget planning.

At present, there is a generally accepted model of public expenditure budgeting by results (as opposed, for example, to the cost model). The main target indicator of innovative project financing is an innovative product or service (research, educational), or work (know-how, invention). The financial resources recipients are the producers of these innovative products (services, works) - budget educational and research institutions, non-profit organizations, etc. The essence of the model for innovation activity provision with resources is that each of the recipients is given a state (municipal) task to create a product (services, work) for a period of 1 to 3 years, supported by appropriate funding. The amount of funds allocated can be changed only after the expiration of the task, taking into account the quality and the volume of manufactured products.

As practice shows, the "task" (the indicator is the volume of innovative products or the amount of work performed by an innovative object) - “result” (the amount of allocated budget funds) relation has coordination difficulties concerning various innovative programs in one regional funding portfolio due to the use of different methodological approaches to managerial influence subject and object choice at various stages of the funded project implementation. In the case of the sectoral budgeting method application (program-target planning), the object is a budget institution, and its product (service, work) is the management subject, symbolizing the result of the sectoral object activity. But for the territorial system of budget spending and planning this product (service, work) is an object for the implementation of which funding is provided. At the point of contradiction, subject-objective interests of sectoral, regional, inter-regional, and federal budget holders collide, who are not always ready to send their funds to such “conflict” points of innovation economy growth. And then the regulator resorts to the use of other tools and methods for a financing program selection. Thus, the work of educational and research institutions as the innovation infrastructure objects is assessed by quantitative indicators that indirectly characterize the innovation process quality, in particular: the number of patents registered during the R&D implementation, the number of students enrolled in post-graduate school (doctoral studies), the number of defended candidate (doctoral) theses, the publishing activity of employees, etc. Some scholars and representatives of the professional community consider such indicators uninformative, and the content of reporting provided by institutions is questionable for an adequate innovation activity assessment and management decisions made on their basis [34-36]. Nevertheless, on the basis of such indicators, the effectiveness of a specific scientific and educational institution, and the scientific potential of the territory is assessed and, accordingly, decisions are made on the allocation of funding.

Taking into account the fact that innovative products (services, works) are the indicators of federal and regional target programs decomposed to the individual institution level, nowadays it is necessary to form a new innovation policy budget mechanism that takes into account the multilevelness of Russian innovation system on the one hand, and the need in the application of a comprehensive, methodologically verified instruments of innovative development territorial and sectoral management.

5. Conclusions

1. The budget mechanism is the way of budgetary relation organization by the state in order to ensure innovative development by supply chai nstrategy. The Innovative Development Strategy of Russian Federation until 2020 sets ambitious goals for the high-tech sector development, which implies active financing with a high return on invested capital.

2. Preservation of Russian innovation policy budget mechanism in its current form does not satisfy the long-term interests of the country. Currently, there is an urgent need to improve the budget mechanism of Russian national innovation system. The dominant centralization of innovation management leads to the regional role weakening in the innovative development in Russia. The main reasons for this problem emergence are the disintegration of the existing budget mechanism and the existing territorial-sectoral management

model, the contradictory nature of the subject-object interests of the participants in the budget financing process within the program-target planning system. Simultaneously with the improvement of the regional budget policy instruments, it is advisable to develop a set of management decision-making algorithms at the regional level for each stage of an innovative project (design, budgeting, execution), without distorting the essential characteristics and the order of the innovation system regulation at all management levels.

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